

III

Soybean Digest



Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

VOLUME 2 • NUMBER 3



JANUARY • 1942

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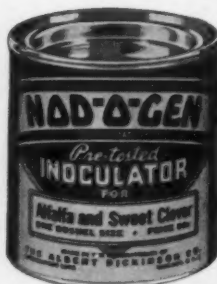
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THE *Soybean Digest*

Vol. 2

JANUARY ☆ 1942

No. 3

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Published on the 15th of each month at Hudson, Iowa, by the American Soybean Association. Entered as second class matter November 20, 1940, at the postoffice at Hudson, Iowa, under the Act of March 3, 1879. Forms close on 10th of month. Subscription price to association members, \$1.00 per year; to non-members, \$1.50 per year.

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SOYBEAN OIL RUBBER PROMISED

AS THE nation is faced with a rubber shortage, it is a pleasure to announce that our contribution to the nation — soybean oil — may provide an important source of synthetic rubber.

A Washington release of January 5 quotes Dr. G. E. Hilbert of the Bureau of chemistry and engineering, U.S.D.A., as saying that a recent "break" in research at the Peoria, Ill., laboratory, points to a synthetic rubber process from soybean and corn oil, cheaper and better than the "buna process," from which factis for artgum erasers is made.

A pilot plant for manufacture of rubber from soybeans and corn is now under consideration, and Dr. Hilbert said that some production may be expected within the next 6 months.

The basic process in the new method is the removal of the "drying oils" from soybean and corn oil, leaving the "feed oils" for human and animal use. Soybean oil is expected to be the most important source of the new rubber. The new process is said to be cheaper than the "buna process" because it utilizes oil rather than the gas required by the buna synthetics. The raw material also is cheaper.

The Soybean Digest is certain that it speaks for the industry in voicing our congratulations to the men of the "Peoria Lab" for this fine piece of work. While we realize that production of rubber in any quantity from soybean oil is still a long way off, and that we shouldn't be too optimistic, nevertheless this is without question a most hopeful development.

We sincerely hope that our product may be instrumental in aiding the nation in its distress due to the Japanese aggression in the world's rubber producing area, although we of course hope that before the new process is put into full use, the invaded area will have been delivered from the enemy.

As soon as possible we hope to bring you a fuller technical discussion of the new process, and a more exact account of its possibilities.

GOOD news to the soybean industry was the January 2 action of the Office of Price Administration placing the fats and oils ceiling at the October 1 level, instead of at the November 26 level, as was originally announced in the order of December 13.

The OPA, and its director, Mr. Leon Henderson, are to be commended for their deter-

mination to be fair, as is evidenced by this change of rulings. For, as we pointed out in our December issue, soybean oil prices were badly out of line on the original date selected as the price determinate.

In addition, under the new ruling, leeway is allowed for fats and oils which were selling under their normal price on October 1. Under this interpretation soybean oil and linseed oil are allowed a $\frac{3}{4}c$ differential above the October 1 price to rectify the discrepancy which existed even at the 11c level, taking the average of prices over a long period of time.

The general effect of the new ruling was an 11 per cent rise in the price ceiling of all fats and oils, upon which we do not pass judgment pro or con. The new soybean oil ceiling absorbed this 11 per cent, and the additional change corrected the maladjustment.

We are sure that it is essential in this period of stress for all industries to make sacrifices, and the soybean industry is ready to help pay for the war effort in the form of taxes and voluntary contributions. However, we feel that nobody would have been helped through setting the price of a commodity at a price out of line with its economic value.

At this writing, the price of soybean oil has remained somewhat below the ceiling, due no doubt to the ordinary conditions of supply and demand. This, again is ok, providing that fluctuations always are based on fundamental economic causes and not on flimsy speculative maneuvers.

LEST we grow too self-centered, we should realize that soybean oil is only one of 1,800 fats and oils included in the standards, albeit in quantity and in inherent quality an important one. These oils find their markets in a wide number of industrial uses. No one oil could be used for all the purposes which the other 1,799 are used, but they are all so interrelated, that what affects any affects all in greater or lesser degree.

Year by year, fats and oils are becoming more important to our industries and to our very lives. During the first World War we used approximately 6 billion pounds of fats and oils each year. Our "disappearance" of fats and oils during 1941 was ELEVEN BILLION POUNDS.

In the period January to September, 1941, we had an oil and fat disappearance of $7\frac{1}{2}$

(Continued on Inside Back Cover)

THE

Soybean Digest



Published by the American Soybean Association, Hudson, Iowa, as a service to its members. Forms close on 10th of month. Subscription price, to association members, \$1.00 per year, to non-members, \$1.50 per year. Advertising rates on application.

GEO. M. STRAYER, Editor

ROBERT BLISS, Managing Editor

VOL. 2 · NO. 3

Eight Million Acres in 1942?

A FARM management expert in one of our leading Land Grant colleges recently made the statement that the possibilities of future soybean culture are difficult to gauge due to its superiority in feed-value-per-acre-planted to the leading carbohydrate cereals.

Apparently, the farmers of the United States feel the same way, because unless all advance indications are awry, they intend to plant this year a sensational and astounding increase of soybeans.

Suspecting as much, The Soybean Digest wrote a month ago to the Agricultural Adjustment Administration headquarters in each of the leading soybean states. The Agricultural Adjustment Administration recently has conducted an intention-to-plant survey in pursuance of the Food for Freedom Campaign.

Here is what our replies indicate:

(1) The three leading soybean producing states of Illinois, Indiana, and Iowa will grow nearly as many acres of soybeans as the entire nation did in 1941.

(2) These three states alone will produce **NEARLY A MILLION ACRES MORE THAN THEIR AAA 1942 PRODUCTION GOALS.**

(3) Instead of the 7,000,000 acres called for, the 1942 American acreage of soybeans for beans will be well over 8,000,000 acres — possibly approaching 9,000,000 acres.

This compares with the 1940 acreage of 4,961,000 and the 1941 acreage of 5,918,000.

Here is the picture in the three leading soybean states:

Acreage, Soybeans for Beans

	'41	'42 AAA Goal	'42 (Farmers Intentions)
Illinois	2,405	2,686	3,034
Indiana	908	1,090	1,317
Iowa	946	1,018	1,400

The lower Mississippi valley also will more than live up to expectations if the returns from Arkansas are indicative. According to the AAA survey, Arkansas farmers plan to plant 252,000 acres of soybeans in 1942, compared with 110,000 acres in 1941. The Arkansas expectation is thus 50,000 acres above the 1942 goal. In our October issue we predicted a southern shift in the soybean belt. Despite the tremendous acreage increase contemplated by the three leading states, we stick by our guns on that prediction. The tremendous increase of 150 per cent indicated in Arkansas is all — if not more — than the seed situation will bear.

Here are the returns from some of the other states:

Missouri

The state AAA committee estimates that 545,000 acres of soybeans will be planted in the state in 1942. Estimates are based on surveys of township and county committees.

Minnesota

Chairman Chas. W. Stickney of the Minnesota Agricultural Conservation Committee reports 1942 intention-to-plant soybeans at 185,000 acres, as compared with 110,000 acres in 1941.

Wisconsin

The 1942 production of soybeans for grain is estimated at approximately 78,000 acres or 155 per cent of the 1941 production.

Michigan

A soybean acreage of 207,000 is indicated by farmers. However, Thomas D. Kennedy, junior administrative assistant of the AAA, believes that the actual acreage planted will not be quite this great. Michigan has a sizeable dried bean industry — principally white pea and navy beans. Unfavorable harvest conditions this fall resulted in farmers'

planning to plant only 76 per cent of the white pea acreage of 1941 in 1942.

(Ohio reported that figures had not yet been made public. No replies were received from the Louisiana, Mississippi and North Carolina AAA offices.)

— s b d —

Editor to Wed

George M. Strayer, editor of the Soybean Digest, will be married to Miss Jeanne McMahon at the First Methodist Church in Iowa Falls, Iowa, January 24. Miss McMahon is the daughter of Mr. and Mrs. Wilnor N. McMahon, Rowley, Iowa. Following a wedding trip the couple will be at home in Hudson, Iowa.

— s b d —

Dr. Weiss to Army; Work to Continue

Dr. Martin G. Weiss, who reviewed the Iowa State College soybean experimental plots for the 1941 convention of the American Soybean Association, has been called to Camp Roberts, California. Dr. Weiss, last month the proud father of a baby girl, is a first lieutenant in the Field Artillery reserve. Lauren K. Soth, editor of Iowa State college economic publications, was called to Camp Roberts at the same time, and in the same capacity.

In letters to The Soybean Digest, J. L. Cartter, agronomist at the U. S. Regional Soybean Laboratory, Urbana, Ill., and Dr. R. E. Buchanan, director of the Iowa Agricultural Experiment Station, confirmed the appointment of Charles R. Weber to continue the cooperative research at Ames pending the return of Dr. Weiss, who has been granted a furlough for the duration of his army duty.

Weber has had considerable soybean breeding experience at Urbana.

SOYBEAN DIGEST

SOY LECITHIN AIDS INDUSTRY

By JOSEPH EICHBERG
American Lecithin Company

LECITHIN, made in the U.S.A. from home-grown soybeans, is only about 8 years old, but already this lusty youngster serves industry, farmers and consumers in many ways and has been shipped to all parts of the world.

Soybean lecithin first appeared on the American market in 1929 and for several years thereafter was imported from Europe. With the rapid spread in the cultivation of soybeans in this country production of a high quality domestic lecithin soon became feasible, especially with the introduction of solvent extraction methods.

You may well ask, "Just what is lecithin?" Lecithin is a fatty substance constituting a vital part of all living cells; it contains phosphorus and nitrogen. It was discovered in egg yolk and was later found in brain substance. Lecithin occurs universally and not only does it appear to be a vital structural part of the cell, but also to be concerned with proper metabolism or nourishment of the organism. Lecithin is the best known of a group of substances called phosphatides.

Large Content in Beans

While lecithin is present in all oil-bearing seeds, an unusually large amount can be extracted from soybeans (which contain anywhere from 1½% to 3% lecithin). The beans are preferably treated with a petroleum solvent such as hexane which removes a major portion of the lecithin along with the oil. After evaporation of the solvent, a small percentage of water is added and since the lecithin has a marked affinity for water and the oil practically none, the lecithin and water form a heavy emulsion which is separated by centrifuging and is dried under vacuum.

For special purposes the lecithin may be bleached with hydrogen peroxide or may be further purified by means of a selective solvent, usually acetone, or may be fractionated with alcohol. The standard commercial grade of soybean lecithin contains a carrier of about 30% residual soybean oil which protects the lecithin against oxidation and makes

mixing with other materials easier, associated with the lecithin in the commercial product are closely related phosphatides, one of which having similar structure and properties is known as cephalin (lecithin is soluble in alcohol but cephalin is not).

Used in Margarine

Perhaps the earliest commercial use of soybean lecithin was in oleomargarine. Scientists were aware that butter naturally contained 0.1% to 0.2% of lecithin, but that refined vegetable oils, as used in making oleomargarine, contain little if any lecithin due to destruction of the natural lecithin content during refining. It was found that the addition of 0.1% to 0.2% of soybean lecithin to oleomargarine improved the physical properties, especially for frying and baking, and more recently experiments in Wisconsin have shown that lecithin increases the digestibility of the fats.

A vast amount of research has resulted in the development of new and important uses for lecithin, whose recovery from vegetable oils, and indeed very existence, attracted little attention a few years ago. The older types of egg and brain lecithin were too costly (\$5.00 to \$20.00 per lb.) for general application and were used only in tonics and medicinal products; the advent of soybean lecithin in abundant quantities opened up many possibilities, particularly as the quality of soybean lecithin is more satisfactory for industrial purposes. From \$1.40 per pound in 1929, the price of soybean lecithin has steadily declined to a present range of 25c to 35c per pound. Today prices for domestic soybean lecithin of high quality are the lowest in history and the quantities produced are the largest. Broadening of the market remains a major problem in view of the specialized nature of the product and the extent of current production.

Used in Chocolate

Among the comparatively new uses for lecithin may be mentioned its addition to chocolate to improve the keeping properties and work-

ability. Chocolate manufacturers incorporate 0.1% to 0.3% of lecithin to stabilize viscosity and eliminate excess cocoabutter; this results in a more uniform chocolate and in savings in material and processing costs. The chocolate with lecithin has an attractive gloss and is more resistant to the separation and accumulation of fat (cocoabutter) or sugar on the surface of the chocolate (a condition called "graying" or "bloom").

It is thought that the lecithin, being a colloid, promotes a quicker and better mixture of the fat or solids in the chocolate. This same effect is utilized in the grinding of paints, where the lecithin permits a rapid "wetting" of the pigment by the paint oils and gives a finer dispersion. Because oils with lecithin will spread and penetrate better, wood preserved with creosote oils containing lecithin is less likely to "bleed." The lecithin molecule has a dual personality — one side prefers fats, the other side is attracted by water, so that lecithin, with unique colloidal and emulsifying properties, may supply the missing link in systems comprising otherwise incompatible phases. Lecithin is thus used in a wide variety of products, both edible and inedible, all the way from confectionery to cosmetics.

Combats Rancidity

Another valuable characteristic of soybean lecithin is its ability to inhibit oxidation and to combat rancidity. Producers and consumers of fats suffer considerable loss due to rancidity. The addition of from 0.01% to 0.15% of lecithin improves both physical and chemical stability of oils and fats, animal and vegetable. A greater degree of improvement is noted with the natural oils and fats or mixtures than with the hydrogenated products. In some instances the induction period is doubled or tripled. Further, the fats with lecithin are more suitable for use in baking.

The fact that all living cells contain lecithin and that relatively large amounts of lecithin are found in eggs, seeds, milk, wheat germ, etc., and the more important organs of the

(Continued on page 12)

Why Soybeans Should Be Fertilized

By MACK DRAKE and GEORGE D. SCARSETH
Purdue University Agricultural Experiment Station

Ed. Note: Occasionally the sheer merit of an article demands its use. By request we are passing over a large amount of our own material to bring you this article, taken from the November, 1941 issue of "Better Crops With Plant Food."

ONCE agronomists considered all legumes to be soil-building crops. This thought probably came from the experiences with legumes in the first generations of their cultivation. After the first lush growth from the newly broken virgin forest ground, nitrogen soon became the first limiting nutrient element for plant growth, particularly on light-colored upland soils. In the Corn Belt region, phosphorus, potassium, and calcium were still present in sufficient quantities to produce high yields of legumes.

When legumes were grown on these soils, the soil nitrogen content was temporarily increased. The crops that followed the legumes had the benefit of this added supply of nitrogen and the yields increased as a result. Eventually the supply of phosphorus dwindled, and it then became the first limiting factor in the growth of the crops where legumes were used.

Potassium Tried

During the period 1890-1920, the lime-phosphate-legume program provided a profitable system of farming. After several rotations of this program had been completed, it was found that potassium fertilizers would increase the yields and quality of grains. Now, in 1941, agronomists are recommending increasing quantities of phosphate and potash for corn and wheat, with emphasis on supplying enough of these minerals to the grain crops so that there will be an adequate supply for the subsequent legume crop which must furnish the nitrogen for the whole rotation. If the supply of phosphorus and potash is inadequate and/or the soil is strongly acid, legumes will not be very effective in producing available nitrogen because the greatest nitrogen production seems to be dependent upon a favorable fertility condition. If the nitrogen is not supplied by the legume, it must be applied in commercial fertilizer.

Many farmers do not realize that legumes cut for hay or soybeans harvested for grain are soil-depleting crops. There are several logical reasons for this lack of information. Legumes plowed under or legumes cut for hay and the manure therefrom

returned to the soil increase the soil nitrogen and thus increase the yields of the following corn and wheat crops. In this respect legumes behave as soil-building crops only when the whole crop is returned to the soil either directly or in the form of manure.

Yield Increases May Mislead

In a 25-year-old crop rotation experiment on the Soils and Crops farm at Lafayette, where the original soil was unusually well supplied with available phosphate and potash, soybeans in the rotation have increased the yields of corn and wheat by 6 to 8 bushels per acre as compared to where no soybeans were used in the rotation. Inasmuch as fertilizers were applied at the rate of 200 pounds of 2-12-6 per acre to the wheat and 100 pounds of 0-16-0 during the first 20 years and 100 pounds of 0-12-12 per acre during the last 5 years to the corn in all rotations, in addition to manure equal to the produce removed, except the wheat grain, it appears that the increases in the corn and wheat yields were due to the additional nitrogen supplied by the soybeans. In this respect the increased yields make the results appear as if the soybeans built up the whole fertility of the soil. It was only the available nitrogen supply that was increased, for the soil had actually been decreased in its content of available phosphate and potash.

Since the following crop yield is sometimes increased after soybeans when the first limiting growth factor is nitrogen, it has frequently been assumed that soybeans harvested for grain were not hard on the land and were not soil-depleting. With the increased sale of soybeans for commercial uses such as oil, plastics, etc., a large amount of fertility is lost from the farm.

Phosphate Removed

Let us examine the soybean a little further because it is fast becoming an important and favored crop in the Corn Belt, and rightly so. Each bushel of soybeans harvested removes about 0.75 pounds of phosphate (P_2O_5) and 1.0 pound of potash (K_2O) (Table 1). Thus a crop of 20 bushels of soybeans removes 15 pounds of phosphate (equal to 75 pounds of 20 per cent superphosphate) and 20 pounds of potash (equal to 33 pounds of 60 per cent muriate of potash) from each acre. In 1940 a total of 814,000 acres of soybeans were harvested for grain in Indiana and yielded 10,989,000 bushels (Table 2). Roughly this quantity of beans removed 8,240,000 pounds of phosphate (P_2O_5) and 10,900,000 pounds of potash (K_2O), or the equivalent of 45,400 tons of an 0-9-12 fertilizer.

Fertility Returned

Fortunately, a large portion of the soybeans harvested are fed to livestock, either as ground beans or as processed meal, thereby returning part of the fertility to the farms. However, many of the farmers selling soybeans do not feed livestock and thus do not return the minerals to the soil from which they were removed.

According to the Indiana Crop and Livestock Estimates, 1940 (Table 2), approximately 62,043,000 bushels of soybeans have been harvested for grain in Indiana during the 10-year period, 1931-40. This quantity of beans contained approximately 46,500,000 pounds of P_2O_5 and 61,500,000 pounds of K_2O . This would be equivalent to 255,000 tons of mixed fertilizer with an analysis of 0-9-12. Assuming that a freight car hauls 30 tons, this is equal to 8,500 carloads, or 85 trains made up of 100 carloads each. To actually supply the plants with these amounts of

TABLE 1. — PHOSPHATE AND POTASH CONTENT OF SOYBEANS AND WHEAT GRAIN FROM TWO LOCATIONS IN INDIANA*

Analysis of soybean grain	Percent P_2O_5	Lbs. P_2O_5 per bu.	Percent K_2O	Lbs. K_2O per bu.
3 years at Moses Fell Annex fertility plots, Bedford	1.11	.67	1.74	1.04
3 years at Soils and Crops Farm, Lafayette	1.4	.84	1.6	.96
Analysis of wheat grain	Percent P_2O_5	Lbs. P_2O_5 per bu.	Percent K_2O	Lbs. K_2O per bu.
3 years at Moses Fell Annex fertility plots, Bedford	.90	.54	.51	.31
3 years at Soils and Crops Farm, Lafayette	.88	.53	.52	.31

* From Robert Lucas' M.S. Thesis, Purdue 1941, "Plant Nutrient Composition of Some of the Common Indiana Farm Crops as Related to the Fertility of the Soil."

nutrients as a commercial fertilizer, allowances would need to be made for phosphate fixation in the soil and minor potash losses. Thus probably for each of the 100 pounds of 0-9-12 indicated, it actually would require about 125 pounds of an 0-12-12 or 75 pounds of an 0-20-20 commercial fertilizer.

As a matter of fact, the total tonnage of fertilizers consumed in Indiana in 1940 for all purposes was 257,000 tons. Probably only a few tons of this were used for soybeans, since soybeans do not respond well to direct fertilization; therefore, it emphasizes again that soybeans cause a great loss in soil fertility and that somewhere in the rotation, preferably to the grain crop, at least double the usual amounts of phosphate and potash must be used to make the soybeans and offset the soil-depleting effect of growing them.

If this quantity, 62,043,000 bushels, of soybeans were calculated as that many bushels of wheat, the wheat would remove 32,900,000 pounds of P_2O_5 and 19,200,000 pounds of K_2O (.53 pounds of P_2O_5 and .31 pounds of K_2O per bushel). This would be equivalent to 160,000 tons of an 0-10-6 fertilizer. When the plant nutrients removed by soybeans are compared with those removed by other crops, it is plain that this crop is more soil-depleting.

Indiana farmers have complained about frequent clover failures in wheat following soybeans, particularly on light-colored soils. "Dry weather" has been the most common explanation for these clover failures. However, clover seedlings were more successful when seeded in wheat on soils where the fertility level was adequate, either as a result of natural fertility, a livestock system of farming whereby part of the fertility removed by crops was returned, or where commercial phosphate and potash were applied somewhere in the rotation in amounts sufficiently high to maintain the soil fertility.

"Hard on the Land"

Soybean seed production in Indiana has increased from 40,000 acres producing 400,000 bushels in 1925 to 814,000 acres with 10,989,000 bushels in 1940 (Table 2). Research workers are constantly seeking new uses for soybeans. This crop promises to remain a major cash grain crop in the Corn Belt. It is a crop which is easy to grow, easy to harvest, and is high in oil and protein.

However, farmers should not be discouraged from growing soybeans, but should be informed that this cash crop, soybean grain, is hard on the land, that sooner or later the phosphorus, potash, and lime supplied by nature will have to be replenished by commercial plant nutrients if crop yields are to be maintained.

Other legumes, such as red and sweet clovers and alfalfa, are as hard on the land with respect to losses of phosphate and potash as are soybeans if these crops are sold off the farm as hay. However, in ordinary practices these types of legumes are returned to the soil as manures and in this respect are soil conservers.

Soybeans have grown rapidly in importance in the Corn Belt during the last 15 years, are a cash crop well adapted to a wide variation of soil conditions, and fit well in the Corn Belt rotation of crops. This crop is certain to play an important part in the present national defense effort. At present, very little information has been obtained to show a profitable means of directly fertilizing soybeans at the time of seeding. However, other types of experiments now in progress at Purdue, involving plowing under the phosphate and potash, indicate that effective means to fertilize soybeans are being found.

With a favorable price outlook, farmers are faced with the problem of fertilizing their soybeans next spring unless the soils have been adequately fertilized previously in the rotation. If we were to make suggestions for farmers in Indiana on the basis of present facts, these would be our recommendations:

Our Recommendations

If the soil is acid, lime it adequately this winter. This is very important; otherwise the value of some of the fertilizer will be lost. Add enough lime (about 3 tons per acre for central Indiana) to bring the pH of the soil to about 6.2 to 6.8. Next spring, just before plowing the ground for the soybeans, broadcast about 300 pounds of 0-20-20 or 500 pounds of 0-12-12 per acre and plow under. Then do not use any fertilizer when planting the beans. The benefit from the lime will last for at least 10 years, although it has been found profitable to relime in about 6 years. The benefit from the fertilizers will carry over into the second and perhaps the third crops.

To show the importance of plowing down the fertilizer for soybeans, the following information is presented. The yield on an unfertilized Crosby silt loam (pH 5.2) at Lafayette in 1940 was 15.7 bushels of grain or 3,570 pounds of hay per acre. When an equivalent of 1,000 pounds of 4-10-25 had been broadcast and disked into the topsoil immediately before seeding, the yield was increased only 1.9 bushels. (There was no injury to the stand.) However, when this same amount of fertilizer was broadcast and plowed under, the yield was 23.4 bushels of grain or 4,653 pounds of hay per acre. When lime, at the rate of 3 tons per acre, was used with the fertilizer and plowed under, the yield was 28.2 bushels of grain or 5,377 pounds of hay per acre.

SOYBEAN PRODUCTION INCREASED 57.5%



with ROCK PHOSPHATE

Sam Ackerman of Tazewell Co., Illinois (shown above in the midst of his Soybean crop) made this test with 1000 pounds of Rock Phosphate per acre. After applying the phosphate to one section, the entire field was drilled to soybeans. Production on the phosphated portion of the field was 57.5% more (weight of the whole plant) than on the part not phosphated. That's not all! There were 62% more soybeans in the pods of the plants from the phosphated land! This is typical of the results obtained from applying . . .

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or

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Mt. Pleasant, Tennessee

TABLE 2.—BUSHELS OF SOYBEANS PRODUCED IN INDIANA IN DIFFERENT YEARS AND THE AMOUNT OF PHOSPHATE AND POTASH IN THESE BEANS*

Year	Acres harvested for grain	Bushels	Pounds P_2O_5	Pounds K_2O
1925	40,000	400,000	300,000	396,000
1930	131,000	2,114,000	1,580,000	2,100,000
1935	410,000	6,970,000	5,230,000	6,800,000
1940	814,000	10,989,000	8,240,000	10,900,000
1931-40 totals		62,043,000	46,500,000	61,500,000

* Indiana Crop and Livestock Estimates No. 163, 1940.

Answering America's Protein Problem!

By DR. H. W. MILLER
International Nutrition Laboratory

Editor's Note: Dr. Miller, whom we here introduce to the readers of The Soybean Digest, is a leader of the soybean food industry. President of the International Nutrition Laboratory, Mt. Vernon, Ohio, manufacturers of Miller's Soya Foods, he has had a most interesting career.

Graduating in medicine in Chicago in 1902, he went to China the next year as a medical missionary under the Seventh-day Adventist board. He spent 8 years in the interior of China, and then was transferred to the superintendency of the Washington Sanitarium and Hospital, Tacoma Park, D. C., where he remained from 1913 to 1925.

Returning to China in 1925, he established several medical centers in that country and Japan, Korea, the Philippines and the Malay Peninsula.

Becoming interested in dietary problems, because his specialty, goiter surgery, was directly concerned with a dietary deficiency condition, and because of the high Oriental mortality rate due to malnutrition, he began studying the food products which might ease the situation.

This led him to the soybean, because, he observed, malnutrition was not nearly so acute in those sections in which the soybean was an article of diet.

In 1934 Dr. Miller established a food plant in Shanghai from which he manufactured milk from the soybean. As he puts it: "This work was nicely underway when the Japanese invasion of Shanghai resulted in the complete destruction of the plant, and after a year of waiting I again returned to America and established in Mt. Vernon the International Nutrition Laboratory where we have specialized on the processing of the soybean, not only studying varieties best suited for human food, but methods of preparing the bean and also developing processing equipment, that will give us a more satisfactory product."

Dr. Miller has an interesting statement regarding the use of Soya Milk in infant feeding: "In this country nearly a score of babies that we are in touch with have either been started on Soya Milk or have been transferred to it very shortly after birth, and the number of users of Soya Milk for infants are increasing very rapidly. Our results of feeding large numbers of babies and children are to be found in the National Medical Journal of China."

With this personal sketch in mind, we believe that you will find the following article by Dr. Miller on the place of the soybean in the American diet very profitable.

— s b d —

SOYBEAN foods for human consumption have to date been scarcely available in America, and the question arises: Why bother to supplement a dietary which is already so abundant?

Still, it would seem strange if the raw material which has been a mainstay in the Oriental diet for so many centuries could not be utilized in the American diet.

It can be!

That part of the American diet most often lacking is protein. Most animal proteins are cumbered with toxins, and most vegetable proteins are inadequate for nutrition.

Soybeans the Answer

The soybean provides the answer to the protein problem. With a protein content of more than 40 per cent, it is the best source of protein which we have. Its protein is biologically equal to that of meats and animal foods, and it has the advantage of being free from toxins.

The effectiveness of the soybean is strikingly demonstrated in China. Where vegetable protein is abundantly supplied in the diet as in Manchuria, and in North China, we have a stalwart race of people. However, in South China where the major products are oil and sugar we see dwarfed bodies and it is a rare exception to find in the warm climate among oil and carbohydrate feeders a single well-developed individual.

One hundred to 150 grams per day of protein is needed for the growing period of the boy and girl and for the nutritional needs of working men and women all through life.

Checking Cereal Proteins

Now, let us consider the nutritional value of proteins found in some cereals. In wheat, which ranks the highest, we have about 11 per cent protein, but of very poor quality. Corn has still less protein, of an equally poor type. Green peas contain only one-third as much protein as green soybeans, and only 1 per cent as much oil. The same is true of the lima bean.

The outstanding food material found in all the grains and legumes listed above is carbohydrate, which is practically non-existent in the soybean.

Many Things Essential

It is important in the best interests of nutrition that we supply all the building stones necessary for body growth, for tissue repair, and for the secretions of the various glands needed for digestion and body regulation. The soybean in our diet is outstanding for other contents than protein and oil: Namely, thiamin and riboflavin, the Vitamin B complex, and lecithin, the brain food.

We never find Beri Beri or Pellagra where people are abundant soybean users because there is nothing produced in vegetation that yields so rich a content of the Vitamin B complex as the soybean.

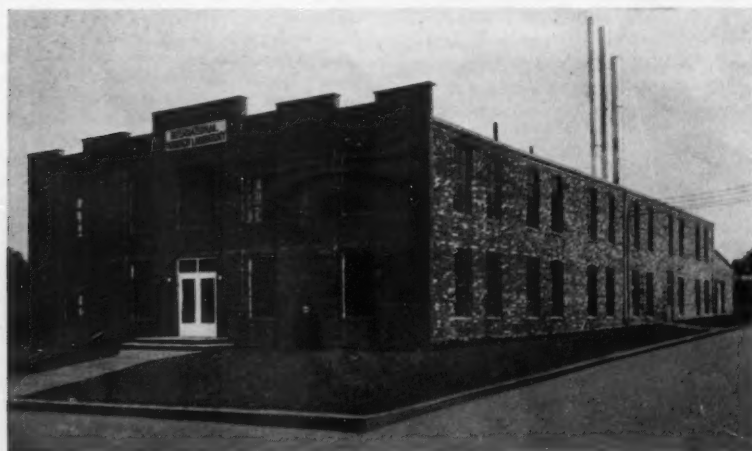
Difficult to Obtain

Unfortunately, it is at present difficult for the ordinary citizen to obtain soybean protein foods.

Soybean milk, soybean cheese, soybean protein loaf, and green soybeans are available at very few of our restaurants, hotels, boarding schools hospitals and markets.

There are plenty of cereals and oils in the ordinary American diet.

However, we do lack proteins, and soybeans can make up the deficiency, at the same time providing such a variety of dishes as to please the most exacting palates.



The International Nutrition Laboratories, Mt. Vernon, Ohio, home of "Miller's Soya Foods"

A View of Soybean America

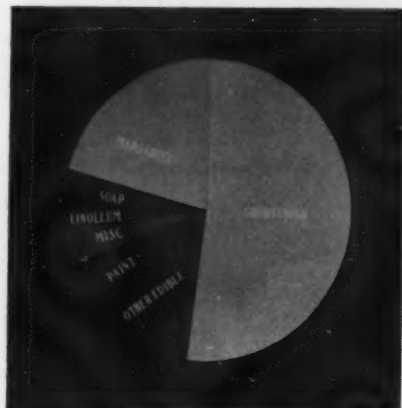
By LAMAR KISHLAR



1 "Ninety-five percent of the soybeans harvested for beans in the United States this year will be harvested in the seven states shown here (Iowa, Missouri, Illinois, Indiana, Ohio, Michigan and Virginia)." Watch the lower Mississippi Valley.—Ed.



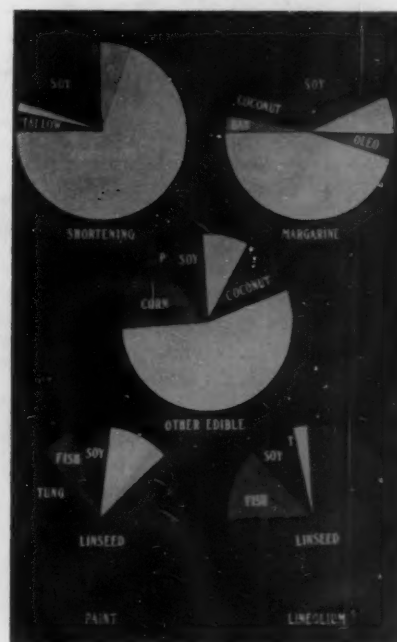
2 "Since Illinois produces about 52 percent of the soybeans harvested for seed, it is natural to expect that central Illinois should do the bulk of the crushing. The size of discs indicates the crushing capacity in the 50 most important soybean crushing centers. The total estimated capacity of all these mills is 82 million bushels. Because actual production figures are usually confidential, the exact bushels crushed in each city cannot be shown."



3 "More than 82.5 percent of all soybean oil produced in the United States is consumed in food products. Shortening takes 52 percent, margarine uses 21 percent, and other edible products such as salad oils consume nearly 10 percent. Paint uses a mere 7.25 percent of the soybean oil made, and linoleum, soap and other technical purposes 10.75 percent. Lower priced linseed oil will largely replace the 1.8 percent which was used for linoleum and oil cloth and the 4 percent which was used for such technical purposes as core oils and printing inks last year."



RESEARCH DIRECTOR—RALSTON-PURINA



4 "Soybean oil now takes . . . 17.8 percent of the shortening market . . . 34 percent of the margarine market . . . 8.3 percent of other edible products such as salad oils . . . 6.8 percent of the paint market . . . 6.5 percent of the linoleum market . . ."

"If all the available mills could be run to capacity and crush 82 million bushels of beans, two million tons or 100,000 twenty-ton cars of soybean oil meal would result. On the basis of 1940, the astonishing proportion of 96 percent of all soybean oil meal produced is fed to livestock, pet stock, and poultry. Two percent of the soybean oil meal is milled and refined to soybean flour, less than one percent is used as fertilizer, and about 1/4 of one percent is used for such industrial purposes as waterproof glue, plastics, foundry core binders, and similar uses."

Manchurian Crop Smaller

SCANT information reaching the U.S.D.A. Office of Foreign Agricultural Relations indicates that the 1941 Manchurian soybean crop may be slightly less than last year. Unofficial estimates place the acreage about 10 percent below last season, but growing conditions during the summer were favorable and it is thought the yield per acre may be higher than in 1940.

The short crop is believed to be primarily the result of the Government policy of marketing agricultural commodities. Early in the spring, it was announced that the official price for 1941 would be 13.40 yuan per 100 kilograms (about 86 cents a bushel) without gunny bags, for beans delivered at Harbin. Under this system, farmers were required to conclude in July or August contracts with Government agents. They would then receive in advance a bounty of 1 yuan per 100 kilograms (6.4 cents a bushel), but the bounty would not be paid for uncontracted produce.

MANCHURIA: Soybean acreage, production, and yield, 1935 to 1941

Year	Acreage		Production	Yield per acre
	Planted	Harvested		
	1,000 acres	1,000 acres	1,000 bushels	Bushels
1935.....	8,162	7,840	141,793	18.1
1936.....	8,570	8,335	153,330	18.4
1937.....	9,012	8,787	159,907	18.2
1938.....	9,560	9,392	157,445	16.8
1939.....	10,287	a/	b/144,952	c/14.1
1940.....	7,764	a/	d/117,579	c/15.1
1941.....d/	6,987	a/		

Estimates of the South Manchurian Railway, 1935-1938; Manchoukuo Ministry of Industry, 1939 and 1940.

a/ Not available.

b/ Trade information places this crop at 125 million bushels.

c/ Yield per acre planted.

d/ Unofficial estimate.

More Beans in Iowa

A FINAL estimate of 16,608,000 bushels of soybeans has been set as Iowa's 1941 production by the Iowa Cooperative Crop and Livestock Reporting Service. This is 17 per cent above 1940 and sets a new high for the state.

The increase was the result of a sharply expanded acreage harvested for beans since the yield at 17.5 bushels per acre is the lowest since 1936. The 1941 relatively low yield reflects a considerable harvesting loss due to shattering and lodging. Quality was lower than usual particularly in fields that were harvested late.

The total 1941 soybean acreage was 11 percent below last year and yet the acreage cut for beans was 34 percent above 1940. The explanation lies in the fact that only 48 percent of the total crop was harvested

Contracts Lag

At the end of June, a total sum of 3,266,000 Manchurian yuan (\$765,000) had been advanced under the contract-bounty system. This would involve contracts totaling around 12 million bushels of soybeans, which is only a fraction of the total crop. A later announcement stated that contracts for 95 million bushels had been concluded by the Government. The trade estimates that commercial production will be below this amount and that there will be unfulfilled contracts of from 10 to 12 million bushels. This represents a considerable sum in Manchurian currency that must be refunded by farmers to the Government. The latter has announced, however, that it will not accept refunds and that the quantities contracted for must be delivered.

Germans Lose Beans

Exports from the 1940-41 crop have not been released, but unofficial reports state that not more than half of the beans or oil supposed to be shipped to Germany, via the Trans-Siberian Railway, had been shipped before the outbreak of Russo-German hostilities. Reliable sources report that 1.3 million short tons of bean cake and 33 to 37 million bushels of beans were to be taken by Japan.

Local consumption of soybeans during the 1941-42 season is expected to exceed 37 million bushels, owing to the greatly enlarged use of soybeans by farmers and the urban population as a substitute for wheat flour, which is almost unobtainable.

for beans in 1940 while 1941's bean harvest amounted to 72 percent of the total acreage leaving only 28 percent for hay and other uses.

— s b d —

Tested — and Approved

Tested and approved! That is the status of soybean oil meal in cattle rations. Investigations by those in charge of cattle feeding and meats tests at the various corn belt experiment stations, the United States Department of Agriculture, and the American Meat Institute, have proved without exception that soybean oil meal was not responsible for off colors in either the fat or lean tissue of beef.

For some years, certain cattle buyers had reported that cattle fed soybean oil meal was under suspicion where cattle had killed "off color." The Soybean Nutritional Research Council consequently requested the tests, which have resulted in a complete refutation of the charges.

Purdue and Ohio Nutrition Meetings Laud Soy Oilmeal

THE responsibility of soybean producers and processors in the "food for freedom" campaign was brought squarely to the fore in the Purdue Nutrition School November 6 and 7 and the Ohio Animal Nutrition conference November 13 and 14.

The reason for this added responsibility is the reaffirmation of the tremendously meritorious position which soybean oilmeal now holds in the eyes of animal nutrition experts as a part of the livestock ration.

For instance, Paul Gerlaugh of the Ohio Station stated that "protein concentrates have been the main factor in making possible the fattening of lighter weight cattle in our feedlots today as compared with a few decades ago."

Bean Meal Experiment

Gerlaugh reported on an experiment at Wooster in which one lot of feeder cattle was fed soybean oilmeal and another lot was fed soybeans. "When we sold the cattle we found that we would have actually been justified in giving the whole soybeans away and paying \$45 per ton for the soybean oilmeal," Gerlaugh said. "We know that one does not need to give soybeans away but I am trying to impress upon you the importance of encouraging your cattle feeding friends to sell their beans and purchase protein concentrates or trade for soybean oilmeal, if they are located where they can get a good trade."

However, Gerlaugh said "I have the feeling that a difference of 20 cents in the price of a unit of protein from one protein concentrate as compared with another will offset the increased efficiency of mixing the two."

Two Pounds per Day

According to Gerlaugh, young calves need about 2 pounds of protein concentrate during the first few months they are in the fattening lot. With yearling cattle he feels that one and one-half pounds per day is about the correct amount.

In regard to minerals, Gerlaugh adds: "We use and recommend a tenth of a pound a day of a mixture of two parts limestone, two parts bone meal and one part salt."

"... I am sure that purchased feeds have become an indispensable part of our present day cattle fattening rations. The younger the animals the greater the amount of purchased feeds that are needed in the ration."

The speakers at the two conferences seemed to agree that animal proteins have some growth producing elements not possessed by proteins from vegetable sources.

For instance, C. W. Carrick of the Purdue department of poultry husbandry, says: "Soybean oil meal has been

(Continued on next page)

Laud Soy Meal

(Continued from page 8)

demonstrated to have proteins of high biological value, but when it is substituted for an animal product like meat scraps, mineral supplements must be used (in poultry rations).

Mineral Supplement

"Excellent egg production has been obtained here from confined flocks fed upon a ration composed largely of corn and soybean oil meal but supplemented with alfalfa leaf meal, bone meal, salt, limestone, oyster shell and fish oil.

"The following ration has given excellent growth with young chickens grown during the winter months and confined in brooder houses:

	Pounds
Ground yellow corn	63.5
Meat and bone scraps,	
50% protein	5
Soybean oilmeal, 41% protein	20
Dried skim milk	5
Dehydrated alfalfa leaf meal	3
Steamed bone meal	1
Ground limestone, 95% CaCO ₃	1
Salt mixture, 9.5 salt and	
0.5 M nSO ₄	0.5
Fish oil (85-D)	1
	100 lbs."

"Superior to Most"

F. B. Morrison, of Cornell University, author of "Feeds and Feeding," which has been an animal husbandry classic for 40 years, told the Purdue conferees: "While well-cooked, soybeans provide protein for non-rumi-

nants that is superior to that from most other plant sources, and only inferior to that of animal origin. . . . To make a ration that is entirely satisfactory in quality of protein, it is generally necessary to furnish part of the protein in

such feeds as milk by-products, fish meal, tankage, or meat scraps. Properly-cooked soybean oilmeal probably approaches these animal by-products most closely in quality of protein."

(Continued on page 11)

INTERNATIONAL TRADE STATISTICS

United States Imports and Exports

July-May, 1939 and 1940-41

(Compiled from U. S. D. A Records)

Office of Foreign Agricultural Relations

EXPORTS — POUNDS

	1939-40	1940-41
Soybeans	709,939,000	5,067,000
All Oil Seeds	714,256,000	13,671,000
Soybean Oil	15,353,000	15,202,000
All Vegetable Oils	81,607,000	107,485,000
Animal Oils and Fats	278,437,000	185,667,000
Total Animal and Vegetable Oils	360,044,000	293,152,000
Oil Cake and Oil Cake Meal	431,200	8,800
Soybean Oil Meal		

Total Exports in Pound Units — Oils,

Oil Meals and Oil Seeds

1,074,731,200

306,831,000

IMPORTS — POUNDS

	1939-40	1940-41
Soybeans	113,000	61,000
All Oil Seeds	953,438,000	925,647,000
Soybean Oil	5,146,000	2,846,000
All Vegetable Oils	769,010,000	707,698,000
Animal Oils and Fats	1,406,000	3,161,000
Total Animal and Vegetable Oils	770,416,000	710,859,000
Oil Cake and Oil Cake Meal	179,399,000	362,621,000
Soybean Oil Meal	22,312,000	19,644,000

Total Imports in Pound Units — Oils,

Oil Meals and Oil Seeds

1,903,253,000

1,999,127,000

BUILD EXTRA STORAGE IN WINTER?



Certainly . . . if you build Neff & Fry super-stave bins. Here is clean, dry storage at low cost. Here is a permanent, profitable addition to your elevator.

N & F super-stave construction, reinforced with steel hoops, has unusual advantages: 1) Each stave is a keystone, giving great strength. 2) Construction time averages only three days. 3) Maintenance is practically zero.

Write for latest catalog.

THE NEFF & FRY COMPANY

Camden, Ohio

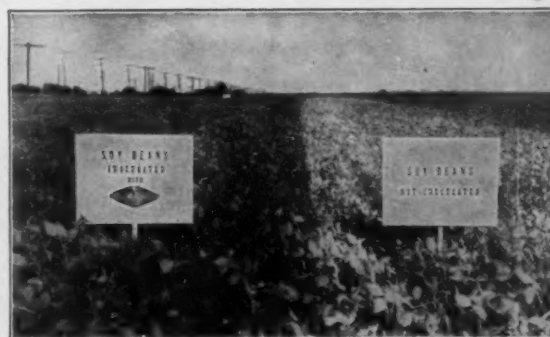
NEFF & FRY STORAGE BINS

JANUARY, 1942

Urbana Culture

Superior Soybean Inoculator

INOCULATION FOR SOY BEANS



EFFECT OF INOCULATION ON SOY BEANS

Treatment	Yield	Pounds Protein per ton	
	Seed	Seed	Hay
Inoculated	46.6 bu.	705	316.2
Not Inoculated	34.7 bu.	621	292.4
Gain for Inoculation	11.9 bu.	84	23.8

(University of Illinois Bulletin No. 310)

Prepared only by

THE URBANA LABORATORIES

Urbana, Illinois

SOYBEANS... and People

Sells to Borden

Mr. George M. Strayer, Soybean Digest, Hudson, Iowa.

Dear Mr. Strayer:

I am enclosing a few soybean recipes that we have found very delicious. I thought you might want to use them in some issue of the Soybean Digest.

Very truly yours,

Alyse Westall Prehn

Mrs. Paul Prehn

Ed. Note: The Prehns operate a group of restaurants in Champaign and Urbana, Illinois, seat of the University of Illinois and the U. S. Regional Soybean Industrial Products Laboratory.

RECIPES

Soybeans in Tomato Sauce

- 1 can of green soybeans
- 2 tablespoons butter
- 2 cups tomato puree or canned tomatoes
- 1/2 teaspoonful cinnamon
- 1/2 teaspoonful cloves
- 1 teaspoonful onion juice
- 1 tablespoonful minced parsley
- 1 tablespoonful minced green pepper
- 2 tablespoonfuls Tupelo honey
- Vegetable salt to season

Put the ingredients in a buttered casserole dish, and bake about half an hour. Strips of bacon across the top, not only add additional flavor, but make the dish more attractive looking.

Soybean Milk

- 1/2 pint warm water
- 1 teaspoonful Tupelo honey
- 1 tablespoonful soybean milk powder
- 1/2 teaspoonful vanilla extract
- 2 tablespoonfuls cream or 1 tablespoonful soybean oil

Combine milk powder with honey and a little water to make a smooth paste. Add remaining water and cream. For variety add 1 1/2 teaspoonfuls baker's chocolate, or cinnamon, or nutmeg.

Soybean Spaghetti With Meat Balls

Boil soybean spaghetti until tender but not broken. Place in collander and rinse with hot water. Place in casserole. Arrange meat balls on top of spaghetti and cover with tomato sauce. Bake at moderate temperature for one hour.

Soybean Biscuits

- 1 cup soybean flour
- 1 egg yolk and 1 tablespoonful Tupelo honey in measuring cup, fill 1/2 full with cold water
- 3 teaspoonfuls tartaric acid baking powder
- 3 tablespoonfuls butter

Sift flour and baking powder together several times. Cut in butter. Add liquids. Shape with fingers. Does not roll well. Bake in hot oven.

These recipes taken from the OFFICIAL COOKBOOK OF THE HAY SYSTEM.

Soybean Fudge

- 3 cups brown or natural sugar
- 2/3 cup Tupelo honey
- 1 cup thin cream (half cream and half water)
- 2 tablespoonfuls soybean milk powder
- 1 cup nuts

Cook to firm ball when tried in water. Add generous portion of butter, after removing from the stove. Cool somewhat and whip until creamy and firm. Add nuts before it gets too firm. Drop on buttered sheet.

— s b d —

Politician: "The farmers of our country should grow more soybeans."

Heckler: "What about hay?"

Politician: "I was talking about food for mankind—however, I'll get to your case in a minute."



DR. JULIUS F. MULLER

The Muller Laboratories, Baltimore, Md., producers of Mull-Soy, soybean milk, have been purchased by The Borden Company, manufacturers and distributors of dairy products.

The laboratories will be operated un-

(Continued on next page)

A Glorious Midwinter Repast

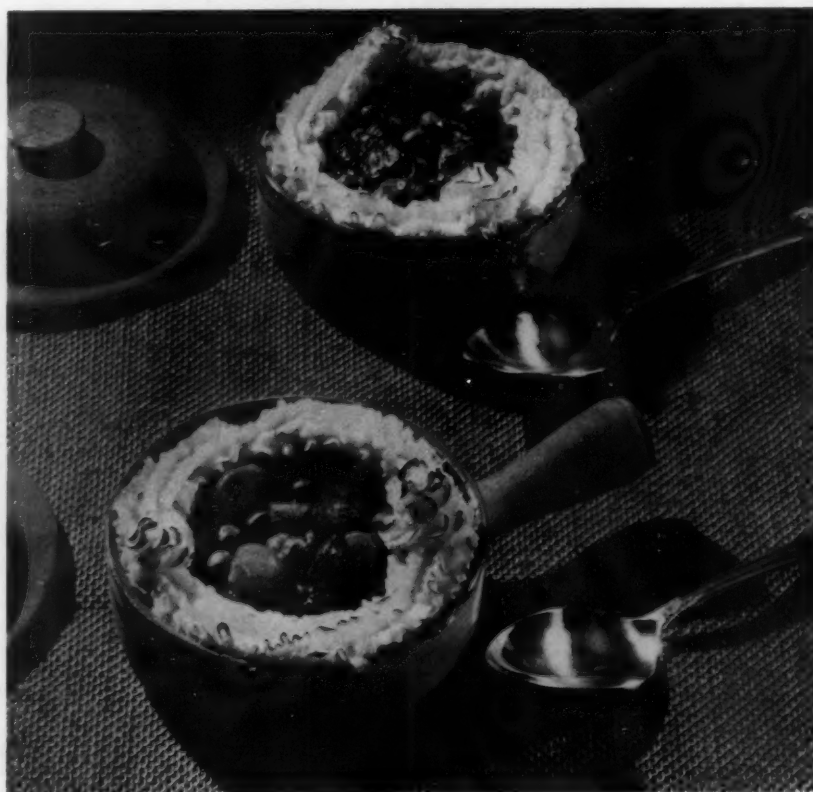


Photo by Shigeta Wright

Pork and beans are a REAL energy food when the beans are SOYBEANS. Rich in protein, the body-building substance, soybeans deserve a permanent place in the American menu.

(Continued from page 10)

der the direction of the Prescription Products Department of The Borden Company and will continue under the management of Dr. Julius F. Muller.

Mull-Soy, which is sold in drug stores on the recommendation of physicians, is in liquid form in tins of 15½ fluid ounces. It is prepared from soybean flour, soybean oil, dextrose, sucrose, calcium and sodium salts. It has been in production since 1936.

Dr. Muller obtained his B.S. degree at Rutgers University in 1922, his M.S. at the same institution in 1928, and his Ph.D. also at Rutgers, in 1930, following a Walker-Gordon Fellowship.

— s b d —

Laud Soy Meal

(Continued from page 9)

Another speaker at Purdue, Frank J. Holt of the White Laboratories staff, quoted Titus in the U.S.D.A. yearbook for 1939 on his rating of protein supplements for poultry: (1 equals highest, 2 next highest, etc.)

Dried Skimmilk	1
Dried Buttermilk	1
Fish Meal (best grades)	1
Meat Scraps	2
SOYBEAN OILMEAL	2
Peanut Meal	2-3
Cottonseed Meal	3
Linseed Meal	3
Corn Gluten Meal	4
SOYBEANS	4

Keynote

Dr. P. B. Curtis, Indiana feed control official, sounded a sort of keynote for the Purdue conference when he said: "It is estimated that more than 600,000 tons (of commercial feedstuffs) were sold in Indiana last year. This tonnage of commercial feed is about twice that sold in 1915 or 1916 when the previous World War was in progress. The increased use of such feeds must be due largely to the demand for balanced rations created by greater knowledge of feed values."

— s b d —

Whole Soybeans Can Be Used in Rations

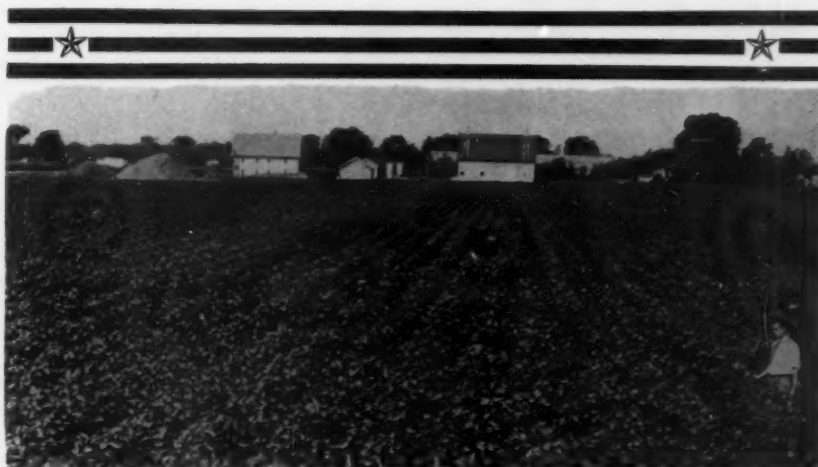
Ed. Note: But soybean oilmeal is cheaper and better.

Whole soybeans, properly fed, have a high feed value in the rations of dairy cows and meat-producing animals, says W. H. Peters, professor of animal husbandry at the Minnesota University farm, in summarizing work already done on soybeans in livestock rations.

Soybeans should be limited to 10 percent of the grain ration, he stressed, otherwise the whole bean may cause soft butter or soft fat, or the animal, after two or three months' time, may lose its taste for the beans and voluntarily cut down on its eating. Digestive disturbances also have been noted as a result of a diet too heavy in whole beans.

Soybeans are just as palatable whole as ground, but if they must be ground to fit the rest of the ration, they should be crushed only medium fine and a fresh supply ground each week to prevent rancidity.

JANUARY, 1942



A Five-Year Defense Program!

Soybean products—as an industrial and agricultural asset to America—are really hardly more than five years old. Yet—what an asset they now are to the nation's productivity and its defense.

Make the most of this by using fine quality, uniform Kellogg Soybean Meal in your feeds. You can rely on it for consistently high protein, and a highly productive palatable supplement in feeds for all livestock.

SPENCER KELLOGG AND SONS, INC.

Sales Offices: Buffalo, Chicago, Decatur, Ill., Des Moines, Minneapolis, Los Angeles

Mills: Buffalo, Chicago, Decatur, Ill., Des Moines, Minneapolis, Edgewater, N. J., Los Angeles

**KELLOGG'S Old Process
LINSEED MEAL**
is the standard of quality. Proven reliable by over 40 years of constant use.



**KELLOGG'S Old Process
SOYBEAN OIL MEAL**
guaranteed 41% protein but containing all the soybean protein and averaging over 43% for twelve months.

"Keep Ahead With Kellogg"

Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.
Minimum insertion \$1.00.

EMPLOYMENT DESIRED. I am seeking to make connection with some food manufacturer where my knowledge will be appreciated. I can make mayonnaise, candy filler, meat substitutes, olive oil, butter substitutes, margarine, chicken flavor, shortening, cosmetics, diabetic foods, soybean nuts, and other articles too numerous to mention. Will be glad to appear for personal interview. Mr. Samuel Siegel, 891 St. Johns Place, Brooklyn, N. Y.

SOYBEAN PRODUCTION IN MEXICO. After several years experimental plantings, thousands of tons can be produced for export.

Would require capital, modern implements. Big opportunities converting Beans into food products. H. R. Donath, Pasaje Borda 108, Mexico. D. F.

WANTED to hear from owner of farm for sale for spring delivery. Wm. Haaley, Baldwin, Wis.

Soybean adhesives glue up to 2.3 billion square feet of plywood yearly—enough to make a 4-foot "board-walk" around the equator four times, with several thousand feet of the strip left over.

— s b d —

According to the U. S. Department of Commerce, United States imports of fats and oils are being maintained in large volume because of domestic demand and a favorable shipping situation. This report was issued prior to the outbreak of war with Japan, Germany and Italy.

Soy Lecithin

(Continued from page 3)

body (as brain, liver) long ago interested physicians and scientists in the precise physiological role of lecithin. In recent years more light has been thrown on the function of lecithin, at present a great deal of clinical work is under way. Many authorities today regard certain substances present in commercial soybean lecithin as members of the vitamin B complex. Modern refining practices tend to remove the natural lecithin content of foods and thus increase the likelihood of dietary deficiency in this respect.

According to recent investigations, the farmer may soon find it profitable to use lecithin reinforced feeds, just as with feeds now fortified with well known vitamins. To give a concrete example, experiments at a Florida Agricultural Experiment Station showed that lecithin supplies an important factor in poultry feeding. Pullets were fed on a diet in all respects sufficient except that lecithin and choline (of which lecithin is probably the best source) were removed or excluded. The average number of eggs laid per bird was only sixteen, however, when one gram of lecithin daily was added to the food, an average of fifty eggs per bird were laid.

Lecithin's Choline Essential

In another experiment ten Rhode Island Red chicks were raised on a diet without lecithin or choline. Although all the other vitamins were given, the birds averaged only five eggs each during the first ninety days of laying. Many did not lay at all. Nearly all the egg yolks aborted. However, when choline, the effective substance contained in lecithin, was added to the same diet, the birds laid an average of thirty-five eggs per bird in the same time.

These results give some idea of the importance which is today being attributed to lecithin by many nutrition experts. Work along many other nutritional and therapeutic lines is in progress and it seems certain that lecithin will be accorded increasing recognition because of its physiological as well as physical properties.

— s b d —

Show at Van Wert

The Van Wert County Soybean show committee, Van Wert, Ohio, is sponsoring a banquet and soybean roundup on the evening of January 20. Presentation of information on soybean growing and the use of soybeans in industry feature the program, according to W. G. Weigle of the committee in charge.

Farm Home Weeks Feature Soybean

Results of the Illinois and Iowa 10-acre soybean yield contests will be carried in the February issue of The Soybean Digest. Reports of farm and home week features of interest in the various states also will be carried.

All farm and home weeks in soybean producing states will carry features of interest to the soybean industry. Members of the American Soybean Association are urged to check these features, and attend them if possible. The American Soybean Association and the Iowa Soybean Processors Association have cooperated with Iowa State College to bring to the Iowa farm and home week, during the second week of February, a particularly strong soybean program.

— s b d —

Farlow I. C. Agent

The Illinois Central Railroad announces the retirement of H. J. Schwieter, and the appointment of P. R. Farlow as general agricultural agent of the railroad. The I. C. Agricultural Department ran the first "soybean train" in Illinois in 1927, and since that date has run another in Illinois and one in Iowa. Mr. Farlow pledges cooperation in educational efforts in behalf of new growers of soybeans.

— s b d —

Inspections Listed

Following is a listing of soybeans inspected under the United States Grain Standards act in the leading soybean states of the midwest for the period December 1 to 15:

State	Total Carlots
Illinois	3,983
Indiana	185
Iowa	617
Missouri	42
Ohio	338
Total	5,165

— s b d —

Call for Inspectors

Applications for the position of junior supervisor of grain inspection have been called for by the United States Civil Service Commission. Application blanks, which may be secured at any first or second class post office, must be filled and in the hands of the Commission at Washington not later than February 16.

— s b d —

Purchase Soy Flour

The United States Surplus Marketing Administration purchased 4,500,000 pounds of soy flour during the single week ending December 27. This is above the monthly average for the last half of 1941.

Iowa Soybean Tests

Iowa's secretary of agriculture, Mark G. Thornburg, reports that Hardin county soybeans of the Illini variety were highest in oil content in the December state laboratory tests. The high sample, grown by V. C. Parsons of Union, Iowa, tested 19.06 per cent oil content, McClave soybeans grown on the same farm showed an oil content of 14.99 per cent.

McClave samples showed the lowest oil content, and the highest moisture content.



A good crop of soybeans will grow on good land without proper inoculation—but it grows at an extra cost of at least \$10 per acre in nitrogen taken from the land.

Neither prior crops nor the presence of nodules guarantee the proper inoculation necessary to take this nitrogen "Free From the Air."

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INOCULATION

"THE PEER OF THE BEST"

Guarantee proper inoculation at a cost of only pennies per acre

TOP RANKING QUALITY AT NEW LOW PRICES

2 bushel size.....\$.30
5 bushel size..... .45
25 bushel size..... 1.95
30 bu. size (6-5 bu. cans)..... 2.60

KALO INOCULANT COMPANY
QUINCY, ILLINOIS

MARKET SUMMARY

SOYBEANS			
Chicago Futures	January 9	January 2	December 9
December			1.71
May	1.83½	1.83½	1.75½
July	1.85½	1.84½	1.76½
SOYBEAN OIL			
Tanks, Midwest Mills.....	11¼c	Nom.	9¾-10c
SOYBEAN OILMEAL			
December			37.00
May	39.15	39.35	36.75
	@39.50	@39.50	
July	39.05	39.15	36.85
	@39.50	@39.50	
CASH CONVERSION SCALE			
1 Bushel Soybeans, wt. 60 lbs.....			\$1.74
I N T O			
8.8 lbs. Crude Oil @ 11¼c.....			\$0.99
49.5 lbs. Meal @ 1.85c.....			.916
1.7 lbs. shrink			
			\$1.906
Gross processing margin per Bu.....			16.6c
Gross processing margin per Bu. last month.....			17.2c

Rebounding from the January 2 revision of the OPA price fixing order, soybeans closed the period under survey from 8 to 9 cents higher than the levels held a month previously. Following publication of the revision, soybean futures moved within narrow limits, apparently finding their niche in the war economy.

Soybean oil was strong, although not pushing the 11¼c limit assigned to it. Soybean oilmeal also was strong, and on January 10, the day following this period, pushed up 40 to 50c per ton. Soybean oilmeal was being produced at capacity in response to previous orders. Offerings for January and February delivery were limited, but were ample for March forward. Buying was spotty, with buyers awaiting final action on price control legislation. Long range prospects were for strong markets in beans, oil and meal.

The gross processing margin, as reflected in the Cash Conversion Scale, declined slightly during the month.

EDITORIALS

(Continued from page 1)

billion pounds. Of this about 3.6 billion pounds was vegetable oil. Soybean oil disappearance for the 9-month period was 425,000,000 pounds, or nearly one-eighth of the vegetable oil disappearance.

On the other hand, the soybean oil PRODUCTION of 409,000,000 pounds from January to September was nearly ONE-SIXTH of the vegetable oil production in the United States.

The difference is caused by the excess of imports over exports. During this period we imported 659,000,000 pounds of vegetable oil, and exported only 91,600,000 pounds. What will the Pacific situation do to this nation's industry? More than half of our vegetable oil imports — mostly tung, perilla, palm, and coconut oil — come from the Pacific area.

Fortunately, on September 30, 1941, reports the United States Department of Agriculture, we had on hand just over 1 billion pounds of vegetable oil, which in quantity alone represents more than 2 full years' normal imports from the Orient.

Substitutes for coconut oil are available in the form of babassu and similar oils in South America, and West Africa. However, transport difficulties must be overcome. An alternate source of coconut oil is East Africa. Brazilian oiticica oil and dehydrated castor oil are being used to supplement tung oil and perilla.

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"OUR national self-interest and our humanitarian instincts challenge us to do this job of producing food and do it on a scale that will write history."

"IN the day of victory when the nations sit down at the peace table our food stockpiles, ready to be drawn on by the famished people of the Old World, will give great force to our views. For they will show once and for all that democracy builds for the needs of common men."

"BY winning our American battle of farm production we will help to make it possible once again for men in all parts of the earth to live in comfort and in tolerance and in freedom."

— CLAUDE R. WICKARD,
Secretary of Agriculture.

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● It is not generally known that the protein of Soybean Oil Meal has several parts, called amino acids. Certain of these are absolutely necessary for livestock maintenance and growth.



The Staley Customer NEVER GUESSES He Knows!

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Different feeds carry these "essential" amino acids in varying proportions. If you are interested in learning more about them, send for our free booklet: STALEY'S SOYBEAN OIL MEAL.

Each carload of Staley's Soybean Oil Meal leaving our plant has its own certificate of analysis. You KNOW what you are buying.

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DECATUR, ILLINOIS **A. E. STALEY MFG. COMPANY** PAINESVILLE, OHIO

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Then you should be feeding Purina Chows. These feeds are supplements to your grain and they are made to do a more profitable job of producing pork, eggs, or milk than straight grain will do. And they use soybean meal as a major source of protein. In fact, Purina Mills is the largest user of soybean oilmeal in the country. Use the feeds that utilize the beans you grow! Purina Mills, St. Louis, Mo.

